AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): An optical modulation element, comprising:

a liquid crystal layer having a helix pitch *p* and having an average refractive index *n*, wherein said liquid crystal layer ~~and~~ is held between a pair of transparent substrates having opposing transparent electrodes;

a white light source for sending white light onto a surface of one of said transparent substrates of said liquid crystal layer in an oblique direction, said white light comprising a plurality of wavelengths including a wavelength λ, wherein said white light is incident on said liquid crystal layer at an angle θ; and

at least one flat mirror arranged outside the other one of said transparent substrates to reflect the incident light transmitted through said liquid crystal layer toward said light source,

wherein a light beam having said wavelength λ is selectively reflected from the liquid crystal layer, and

wherein said selected wavelength λ is determined by selecting at least one of the incident angle θ and the helix pitch *p*, in accordance with the relationship $p \cdot \cos\theta = \lambda / n$, ~~p being the helix pitch, θ being an incident angle of said white light on the said liquid crystal layer, λ being a wavelength of said plurality of wavelengths of said white light, and n being an average refractive index of the liquid crystal.~~

2. (cancelled).

3. (currently amended): An optical modulation element, comprising:

a liquid crystal layer having a helix pitch p and having an average refractive index n, wherein said liquid crystal layer ~~and~~ is held between a pair of transparent substrates having opposing transparent electrodes;

a white light source for sending white light onto a surface of one of said transparent substrates of said liquid crystal layer in an oblique direction, said white light comprising a plurality of wavelengths including a wavelength λ, wherein said white light is incident on said liquid crystal layer at an angle θ;

a first flat mirror arranged outside the other one of said transparent substrates of said liquid crystal layer to reflect the incident light transmitted through said liquid crystal layer in an incident direction thereof; and

a second flat mirror for reflecting the light reflected by said first flat mirror and by said liquid crystal layer in the incident direction thereof,

wherein a light beam having said selected wavelength λ is selectively reflected from the liquid crystal layer, and

wherein said selected wavelength λ is determined by selecting at least one of the incident angle θ and the helix pitch p, in accordance with the relationship $p \cdot \cos\theta = \lambda / n$, ~~p being the helix pitch, θ being an incident angle of said white light on the said liquid crystal layer, λ being a wavelength of said plurality of wavelengths of said white light, and n being an average refractive index of the liquid crystal~~

4. (cancelled).

5. (original): An element according to claim 3, wherein said first and second flat mirrors form an integrated mirror having an L-shaped section, or a saw-toothed mirror.

6. (cancelled).

7. (original): An element according to claim 5, wherein said saw-toothed mirror and the other one of said transparent substrates are integrally formed.

8. (cancelled).

9. (previously presented): An element according to claim 1, wherein said transparent electrodes comprise transparent electrodes comprise transparent electrode groups divided into stripes such that a plane perpendicular to a longitudinal direction thereof intersects an incident surface group of the incident white light.

10. (previously presented): An element according to claim 3, wherein said transparent electrodes comprise transparent electrode groups divided into stripes such that a plane perpendicular to a longitudinal direction thereof intersects an incident surface group of the incident white light.

Claims 11-12. (cancelled).

13. (previously presented): An optical modulation element, comprising:

a liquid crystal layer having a helix pitch and held between a pair of transparent substrates having opposing transparent electrodes;

a white light source for sending white light onto a surface of one of said transparent substrates of said liquid crystal layer in an oblique direction;

a first flat mirror arranged outside the other one of said transparent substrates of said liquid crystal layer to reflect the incident light transmitted through said liquid crystal layer in an incident direction thereof; and

a second flat mirror for reflecting the light reflected by said first flat mirror and by said liquid crystal layer in the incident direction thereof,

wherein an output optical path of a circularly polarized light beam having a selected wavelength and reflected by a liquid crystal surface at one of said transparent substrates, and an output optical path of a circularly polarized light beam having a selected wavelength and reflected by said first and second flat mirrors and a liquid crystal surface at the other one of said transparent substrates do not overlap each other.

14. (cancelled).

15. (original): An element according to claim 13, wherein a rotational polarizer and a $\lambda / 4$ plate are arranged in said optical path of one circularly polarized light beam of exit light while a $\lambda / 4$ plate is arranged in an optical path of the other circularly polarized light beam, and exit light beams from said two optical paths are converted into one linearly polarized light beam to be output.

16. (cancelled).

17. (original): An element according to claim 15, wherein said $\lambda / 4$ plate arranged in said optical path of one circularly polarized light beam of the exit light and said $\lambda / 4$ plate arranged in said optical path of the other circularly polarized light beam comprise one $\lambda / 4$ plate.

18. (cancelled).

19. (previously presented): An element according to claim 3, wherein an output optical path of a circularly polarized light beam having the wavelength λ and reflected by a liquid crystal surface at one of said transparent substrates and an output optical path of a circularly polarized light beam having the wavelength λ and reflected by said first and second flat mirrors and a liquid crystal surface at the other one of said transparent substrates overlap each other at least partially.

20. (cancelled).

21. (previously presented): An element according to claim 1, wherein a medium having a refractive index lower than that of said liquid crystal is inserted at least one of between said transparent substrates and said mirror and between said transparent substrates and said incident surface of the incident light.

22. (cancelled).

23. (previously presented): An element according to claim 3, wherein a medium having a refractive index lower than that of said liquid crystal is inserted at least one of between said transparent substrates and said mirror and between said transparent substrates and said incident surface of the incident light.

24. (cancelled).

25 (previously presented): An element according to claim 1, wherein said liquid crystal has a helix axis substantially perpendicular to a substrate surface.

26. (cancelled).

27. (previously presented): An element according to claim 3, wherein said liquid crystal has a helix axis substantially perpendicular to a substrate surface.

28. (cancelled).

29. (previously presented): An element according to claim 1, wherein said liquid crystal has a helix axis substantially parallel to a substrate surface.

30. (cancelled).

31. (previously presented): An element according to claim 3, wherein said liquid crystal has a helix axis substantially parallel to a substrate surface.

32. (cancelled).

33. (previously presented): An element according to claim 1, wherein one of a chiral nematic liquid crystal (cholesteric liquid crystal) and a nematic liquid crystal added with a chiral material is used as the liquid crystal having said helix pitch.

34. (cancelled).

35. (previously presented): An element according to claim 3, wherein one of a chiral nematic liquid crystal (cholesteric liquid crystal) and a nematic liquid crystal added with a chiral material is used as the liquid crystal having said helix pitch.

36. (cancelled).

37: (previously presented): An element according to claim 1, wherein a chiral smectic liquid crystal such as a ferroelectric liquid crystal and an antiferroelectric liquid crystal is used as the liquid crystal having said helix pitch.

38. (cancelled).

39. (previously presented): An element according to claim 3, wherein a chiral smectic liquid crystal such as a ferroelectric liquid crystal and an antiferroelectric liquid crystal is used as the liquid crystal having said helix pitch.

40. (cancelled).

41. (previously presented): An element according to claim 37, wherein a liquid crystal having a chiral smectic CA phase, which is an antiferroelectric phase, is used as the liquid crystal having said helix pitch.

42. (cancelled).

43. (previously presented): An element according to claim 39, wherein a liquid crystal having a chiral smectic CA phase, which is an antiferroelectric phase, is used as the liquid crystal having said helix pitch.

44. (cancelled).

45. (original): A color filter which selectively outputs a light beam within a desired wavelength range by using said optical modulation element according to claim 1.

46. (cancelled).

47. (original): A color filter which selectively outputs a light beam within a desired wavelength range by using said optical modulation element according to claim 3.

48. (cancelled).

49. (original): A color filter according to claim 45, wherein a wavelength range of the selectively output light beam is changed by controlling a voltage to be applied to said electrodes.

50. (cancelled).

51. (original): A color filter according to claim 47, wherein a wavelength range of the selectively output light beam is changed by controlling a voltage to be applied to said electrodes.

52. (cancelled).

53. (original): A liquid crystal display device obtained by combining said optical modulation element according to claim 1 and a liquid crystal display element having a shutter function.

54. (cancelled).

55. (original): A liquid crystal display device obtained by combining said optical modulation element according claim 3 and a liquid crystal display element having a shutter function.

56. (cancelled).

57. (previously presented): A liquid crystal display device obtained by combining an optical modulation element according to claim 15 and a liquid crystal display element having a shutter function, wherein a liquid crystal display element utilizing polarization is used as said liquid crystal display element.

58. (cancelled).

59. (previously presented): A liquid crystal display device obtained by combining an optical modulation element according to claim 17 and a liquid crystal display element having a shutter function, wherein a liquid crystal display element utilizing polarization is used as said liquid crystal display element.

60-72. (cancelled).

73. (original): A device according to claim 53, which performs field sequential display.

74. (cancelled).

75. (original): A device according to claim 55, which performs field sequential display.

76. (cancelled).

77. (previously presented): A liquid crystal display device which performs field sequential display and is obtained by combining an optical modulation element according to

claim 9 and a liquid crystal display element having a shutter function, wherein sequential scanning is performed by synchronizing said liquid crystal display element and said optical modulation element having one of a transparent electrode group and an electrode structure group, said optical modulation element having a longitudinal direction which perpendicularly intersects an incident surface of the incident light.

78. (currently amended): A liquid crystal display device which performs field sequential display and is obtained by combining an optical modulation element according to claim 10 and a liquid crystal display element having a shutter function, wherein ~~and~~ sequential scanning is performed by synchronizing said liquid crystal display element and said optical modulation element having one of a transparent electrode group and an electrode structure group, said optical modulation element having a longitudinal direction which perpendicularly intersects an incident surface of the incident light.

79-92. (cancelled).

93. (previously presented): An optical modulation element according to claim 1, wherein said optical modulation element does not include a polarization plate.

94. (previously presented): An optical modulation element according to claim 1, wherein:

said liquid crystal layer is reflective to a wavelength range of light, if the light is of a circular polarity selected from the group consisting of left and right;

said liquid crystal layer is transparent to the wavelength range of light, if the light is of a circular polarity opposite that of light which is reflected by said liquid crystal layer;

said liquid crystal layer is transparent to light outside the wavelength range; and

the wavelength range is dependent upon the helix pitch of said liquid crystal layer, the wavelength range including at least a first wavelength of the wavelength λ, and excluding at least a second wavelength of the white light.

95. (previously presented): An optical modulation element according to claim 3, wherein said optical modulation element does not include a polarization plate.

96. (previously presented): An optical modulation element according to claim 3, wherein:

said liquid crystal layer is reflective to a wavelength range of light, if the light is of a circular polarity selected from the group consisting of left and right;

said liquid crystal layer is transparent to the wavelength range of light, if the light is of a circular polarity opposite that of the light which is reflected by said liquid crystal layer;

said liquid crystal layer is transparent to light outside the wavelength range; and

the wavelength range is dependent upon the helix pitch of said liquid crystal layer, the wavelength range including at least a first wavelength of the wavelength λ, and excluding at least a second wavelength of the white light.

97. (previously presented): An element according to claim 3, wherein an output optical path of a circularly polarized light beam having the wavelength λ and reflected by a liquid crystal surface at one of said transparent substrates, and an output optical path of a circularly polarized light beam having the wavelength λ and reflected by said first and second flat mirrors and a liquid crystal surface at the other one of said transparent substrates do not overlap each other.

98. (original): An element according to claim 97, wherein a rotational polarizer and a λ / 4 plate are arranged in said optical path of one circularly polarized light beam of exit light while a λ / 4 plate is arranged in an optical path of the other circularly polarized light beam, and exit light beams from said two optical paths are converted into one linearly polarized light beam to be output.

99. (original): An element according to claim 98, wherein said λ / 4 plate arranged in said optical path of one circularly polarized light beam of the exit light and said λ / 4 plate arranged in said optical path of the other circularly polarized light beam comprise one λ / 4 plate.

100. (previously presented): A color light filter according to claim 45, wherein:

said liquid crystal layer is reflective to the desired wavelength range of light, if the light is of a circular polarity selected from the group consisting of left and right;

said liquid crystal layer is transparent to the desired wavelength range of light, if the light is of a circular polarity opposite that of the light which is reflected by said liquid crystal layer;

said liquid crystal layer is transparent to light outside the predetermined wavelength range.

101. (previously presented): A color light filter according to claim 100, wherein the desired wavelength range of the selectively output light beam is changed by controlling a voltage to be applied to the transparent electrodes, thereby changing the helix pitch of the liquid crystal layer.

102. (previously presented): A color light filter according to claim 45, wherein the wavelength range of the selectively output light beam is changed by controlling a voltage to be applied to the transparent electrodes, thereby changing the helix pitch of the liquid crystal layer.

103. (previously presented): A color light filter according to claim 47, wherein:

said liquid crystal layer is reflective to the desired wavelength range of light, if the light is of a circular polarity selected from the group consisting of left and right;

said liquid crystal layer is transparent to the desired wavelength range of light, if the light is of a circular polarity opposite that of the light which is reflected by said liquid crystal layer;

said liquid crystal layer is transparent to light outside the predetermined wavelength range.

104. (previously presented): A color light filter according to claim 103, wherein the desired wavelength range of the selectively output light beam is changed by controlling a voltage to be applied to the transparent electrodes, thereby changing the helix pitch of the liquid crystal layer.

105. (previously presented): A color light filter according to claim 47, wherein the desired wavelength range of the selectively output light beam is changed by controlling a voltage to be applied to the transparent electrodes, thereby changing the helix pitch of the liquid crystal layer.

106. (currently amended): A color filter comprising:

first reflection means for selectively reflecting circularly polarized light, receiving a first light from a first direction at an oblique angle of incidence,

wherein said first reflection means reflects as second light, in a second direction, the first light that is within a selected wavelength range and of a first circular polarization, said second light being of the first circular polarization selected from the group consisting of left polarization and right polarization,

wherein said first reflection means transmits third light, said third light comprising of:

first light that is within the selected wavelength range and of a second circular polarization, said second circular polarization being opposite to said first circular polarization, and

first light that is not within the selected wavelength range;

means for selecting the selected wavelength range; and

second reflection means for reflecting light, receiving said third light transmitted by said first reflection means, reversing the circular polarization thereof, and reflecting the circular-polarization-reversed third light back at said first reflection means as fourth light;

wherein said first reflection means reflects, as fifth light, said fourth light that is within the selected wavelength range and of the first circular polarization, said fifth light being of the first polarization,

wherein said first reflection means transmits, as sixth light, said fourth light that is not within the selected wavelength range, and

wherein said sixth light leaves said first reflection means in a direction parallel to the first direction.

107. (withdrawn): A color filter according to claim 106, further comprising a white light source emitting said first light.

108. (withdrawn): A color filter according to claim 106, wherein said color filter performs field sequential display, sequentially selecting the selected wavelength range from a plurality of different wavelength ranges.

109. (withdrawn): A color filter according to claim 108, wherein the plurality of different wavelength ranges includes a wavelengths range corresponding to red, a wavelength range corresponding to green, and a wavelength range corresponding to blue.

110. (withdrawn): A color filter according to claim 106, further comprising:

third reflection means for reflecting light, receiving said fifth light reflected by said first reflection means, reversing the circular polarization thereof, and reflecting the circular-polarization-reversed fifth light back at said first reflection means as seventh light,

wherein said first reflection means transmits, as eighth light, said seventh light, and

wherein said eighth light leaves said first reflection means in a direction parallel to said second direction.

111. (withdrawn): A color filter according to claim 110, further comprising a white light source emitting said first light.

112. (withdrawn): A color filter according to claim 110, wherein said color filter performs field sequential display, sequentially selecting the selected wavelength range from a plurality of different wavelength ranges.

113. (withdrawn): A color filter according to claim 112, wherein the plurality of different wavelength ranges includes a wavelengths range corresponding to red, a wavelength range corresponding to green, and a wavelength range corresponding to blue.

114. (withdrawn): A color filter according to claim 110, wherein an optical path of said eighth light, as it leaves said first reflection means, does not overlap with an optical path of said second light.

115. (previously presented): A color filter according to claim 110, wherein an optical path of said eighth light, as it leaves said first reflection means, at least partially overlaps with an optical path of said second light.

116. (previously presented): A color filter according to claim 110, further comprising means for converting said second light and said eighth light into linearly polarized light of a same linear polarization.